UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL ENVIRONMENTAL SATELLITE DATA
AND INFORMATION SERVICE
NATIONAL CLIMATIC DATA CENTER
151 PATTON AVE ROOM 120
ASHEVILLE NC 28801-5001

21 August 2014

MEMORANDUM

From: Deke Arndt, Chief, Climate Monitoring Branch, CSMD, NCDC
To: Thomas R. Karl, Director, NCDC
Subject: SCEC Decision: New record 24-hour Precipitation for New York

On 20 August 2014, the State Climate Extremes Committee (SCEC) convened via teleconference to evaluate the validity of an apparent 24-hour precipitation record for the State of New York. On 12-13 August 2014 24-hour precipitation total of 13.57 inches at The Federal Aviation Administration (FAA) Automated Surface Observation System (ASOS) station located at Long Island MacArthur Airport in the hamlet of Ronkonkoma within the Town of Islip, New York.

The SCEC examined several factors surrounding the value, including intrinsic and extrinsic validity, methods and practices of observation, and comparison to the accepted record for New York. The SCEC voted unanimously (5-0) to accept the value. ***I request that the NCDC Director approve the SCEC's decision and recognize the 13.57 inch 24-hour precipitation total which occurred between 9:00 pm EST on 12 August and 8:59 pm EDT on 13 August 2014 as the new New York state record for 24-hour precipitation.***

Details related to this decision are included below, with much more detail provided in a draft report compiled by the Meteorologist in Charge of the National Weather Service Weather Forecast Office in New York, New York ("WFO New York"), which has forecast and warning responsibility for the Islip location. That report is attached here as Attachment A.

A more complete descriptive and meteorological assessment is expected in the form of a publicly-available web page hosted by WFO New York. This memo will be updated with that URL when it becomes available.

Disposition:

[ ] Approved

[ ] Not Approved

<s> _____ Data Center Director

_____ Date

Meteorological / Climatological Feasibility

The event was determined to be meteorologically plausible. Details are provided in Attachment A. In short, deep moisture, onshore flow, a focusing frontal boundary, enhanced associated with mesoscale features, and along-front translation of convective cells contributed to a scenario conducive to heavy rainfall with extraordinary local/mesoscale totals. Indeed, there was significant flooding in the Tri-State area on the days associated with this record.

The KISP station's routine inspection record was up to date (valid quarterly inspection) at the time of the event. Additionally, WFO New York also conducted a site visit in the hours following the event, and found the station to be in good working order, wind baffling to be in place and working properly, and no obstructions to the AWPAG weighing bucket. The on-site inspection, complete with photos, is detailed more thoroughly in the Attachment A.

Background and Metadata

The Long Island MacArthur Airport (COOP ID #304130/WBAN #04781; hereafter referred to by its ICAO identifier KISP) is an automated station operated by the FAA in cooperation with the National Weather Service. KISP is located in the village of Ronkonkoma in the Town of Islip, New York, at 40.794°N, -73.102°E, or roughly central Long Island. Its elevation is roughly 84 ft. ASL. See Figure 1.

During the course of this investigation, it was discovered that a past administrative action with KISP's metadata resulted in the station being considered administratively closed for some NCDC purposes. This did not affect the observation or the station's operational utility to the NWS, and the data are actively archived at NCDC, so the SCEC did not consider this a threat to the validity of the record. The issue is being worked via a B-44 rendition form, and the station will be administratively re-opened, retroactive to the date of the previous action.

Fig. 1: Location of the site relative to the Tri-State Region. From NCDC's Historical Observing Metadata Repository: http://www.ncdc.noaa.gov/homr/#ncdcstnid=20019444&tab=LOCATIONS

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Evaluation of Existing Record(s)

The NCDC-recognized state record for 24-hour precipitation is currently 11.6" on 27-28 August 2011, at Tannersville, NY. For the Tannersville investigation, that SCEC examined much of New York's extreme rainfall data, particularly in the Federal observing networks, and shored up several loose ends in the process. Their work made this investigation much more direct and straightforward.

A non-Federal pretender to the state record exists in the form of a CoCoRaHS observation of 13.80" taken near Smithboro on 8 September 2011. The WFO Binghamton was previously aware of this observation, and had considered it dubious. They re-visited it for due diligence, and determined that this observation is not supported by evidence from other platforms or the events of that day, and is very likely a multiple-day total. The SCEC agreed with this assessment.

Another heavy rainfall event was observed in July 1942, when a purported 14.0" fell near Wellsville, near the Pennsylvania border. However, this observation was unofficial, in that it was not made by an official observer using purpose-built equipment; it was a "bucket value". Little official record exists beyond an appendix of a U.S. Weather Bureau report on the heavy rain events, which noted quality control concerns of the day (the catch pan may have been inundated by a creek flood). This event may warrant future consideration, but is not currently considered a legitimate candidate for the record.

Conclusion

After review and discussion, and noting the administrative actions to take, the SCEC voted unanimously (5-0) to recognize the 13.57 inch 24-hour rainfall total from KISP on 12-13 August 2014 as the state record for 24-hour precipitation in New York.

Acknowledgements

NCDC thanks WFO New York for its excellent work on collecting data, maintaining the health of the observing network there, and providing a comprehensive and compelling summary. We also thank WFO Birmingham (NY) for their expertise in analyzing the Smithboro observation.

State Climate Extremes ad hoc Committee Members:

Tim Morrin, Observation Program Manager, National Weather Service, New York, NY [voting]
Dan Kelly, WFO Buffalo, NY, for NWS Eastern Region Headquarters (CSPM position vacant) [voting]
Keith L. Eggleston, Regional Climatologist, Northeast Regional Climate Center [voting]
Mark Wysocki, State Climatologist, New York State Climate Office [voting]
Derek Arndt, Chief, Climate Monitoring Branch, National Climatic Data Center [voting]

I. Ross Dickman, Meteorologist in Charge, National Weather Service, New York, NY [advisor]
Elvis Gilt, Meteorological Technician, WFO Binghamton, NY [advisor]
Bryant Korzeniewski, Ingest and Analysis Branch, National Climatic Data Center [advisor]

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Attachment A (to be provided as separate document on the SCEC website)

This report from WFO New York provides some of the real-time observations of the day, public statements made by the WFO, and a detailed description of the meteorological situation.

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service New York City, NY
Upton, New York 11973

August 19, 2014

MEMORANDUM FOR: New York State Climate Extremes Committee

FROM: I.Ross Dickman, Meteorologist in Charge, National Weather Service New York NY -<signed>

SUBJECT: New State 24-hour Precipitation Record

Proposal

A new New York State 24-hour Precipitation Record is proposed for Ronkonkoma (Town of Islip), NY (LI MacArthur Airport), KISP NY, Suffolk County. Between 9:10 PM EDT 12 August 2014 and 7:54 PM EDT 13 August 2014, **13.57 inches of rain** was recorded in the All Weather Precipitation Accumulation Gauge (AWPAG) at the FAA Automated Surface Observation System (ASOS) at KISP. This station is identified as LI MACARTHUR AP Station Number 30-4130 in CSSA.

The KISP ASOS gauge records precipitation to the nearest one hundredth of an inch every 5 minutes and transmits the data each hour. A complete record of hourly observations received from the site during the event is presented in METAR format in Appendix A.

Current Record

The current 24-Hr Precipitation record for the state of New York is Tannersville, NY, in Greene County. Between 3:45 PM EDT 27 August 2011 and 1:45 PM EDT 28 August 2011, **11.60 inches of rain** was recorded in the Fisher Porter rain gauge at the National Weather Service Cooperative Observer Station.

Meteorology

On August 13, 2014, 13.57 inches of rain was recorded at Islip, NY. An anomalously deep, negatively tilted upper level trough was moving across the northeast during the morning of August 13th. This trough transported deep moisture over Long Island with precipitable water values close to 2 inches (1.81 inches on KOKX 12z 13 August 2014 sounding), which is just under 2 standard deviations above normal. At the surface, a parent low pressure was moving into southeast Canada with a secondary low developing approximately 50 miles south of Jones Beach, NY. Heavy precipitation focused along and just north of the warm front associated with the secondary low pressure system. Several weak mesoscale lows were also observed on KOKX 0.5 degree velocity data which may have helped strengthen the low level convergence along the warm front and help maintain heavy rainfall over Ronkonkoma (Town of Islip), NY for several hours. The 0-6 km storm motion from the KOKX 12z 13 August 2014 sounding was 210 degrees at 17 knots, which was parallel to the orientation of the warm front. It is likely that these factors contributed to the heaviest precipitation occurring over Ronkonkoma (Town of Islip), NY.

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Dual Pol Storm Total Preciptation Accumulation

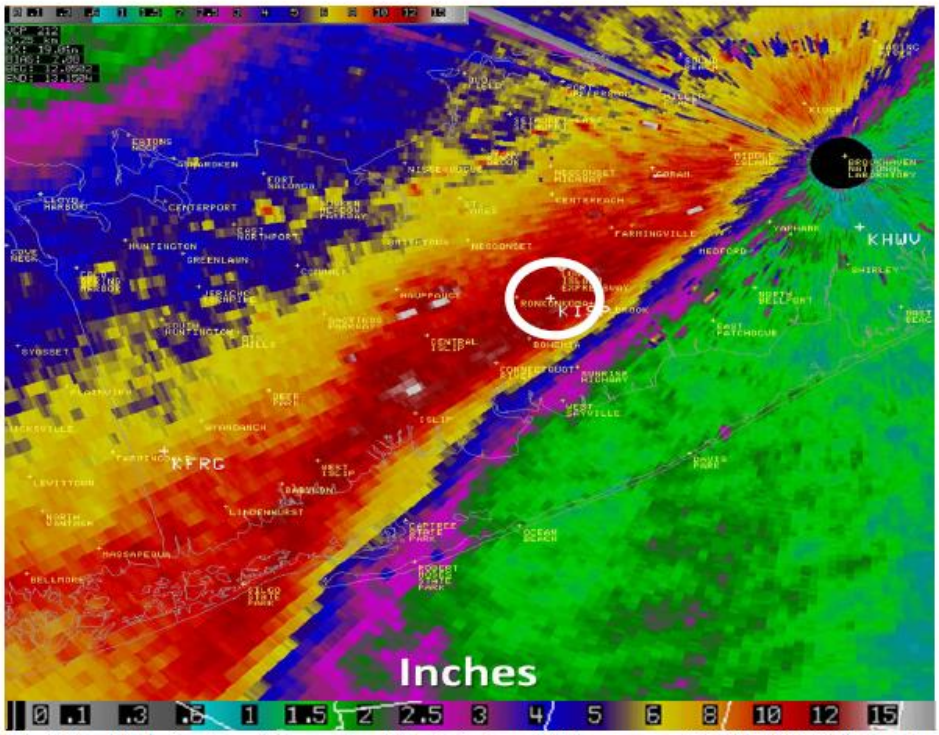

Fig 1. Dual Polarization of Storm Total Precipitation (STP) map as of 12 PM EDT Wednesday, August 13, 2014, depicting the location of heaviest rainfall during the last 24 hours, which in turn produced major flash flooding across Long Island. The heaviest precipitation fell in a narrow band across eastern Nassau County to northern/central Suffolk County and into southern CT.

Appendix A contains the Public Information Statement (PNS) showing the unofficial observations taken during the 24 hour period for this storm. This information is included because it collaborates information contained in the STP seen in Fig 1.

Site Visit

During the afternoon of August 13, 2014, Michael Cox, Electronic Technician from NWS New York NY, performed a site visit of the KISP ASOS station. He observed the equipment in good working order. An active quarterly inspection was valid at the time. Michael paid particular attention to the AWPAG Gauge to determine that there were no obstructions in the weighing bucket. He found that only rain water was present.

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Fig. 2. This picture of the ASOS platform was taken Monday, August 18, 2014 . The AWPAG is positioned in the foreground. What can be clearly seen, there are no obstructions to the gauge and the wind buffer array is in place.

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Metadata

This ASOS was commissioned in the summer of 1992. The precipitation gauge was upgraded from tipping bucket to AWPAG in May 2004.

Conclusion and Recommendation

The 13.57 inch rainfall total reported at the FAA ASOS station at Islip Macarthur airport NY (KISP) meets all reporting requirements. Information received from the KISP site is consistent with the surrounding reports, STP and damage reports received during the day of the event. Further, it is acknowledged that the total observed precipitation exceeds the current NCDC New York State record of 11.60 inches at Tannersville NY.

Therefore, I recommend that the total of 13.57 inches recorded at Ronkonkoma (Town of Islip), NY be accepted as the new 24-hour New York State precipitation record.

Acknowledgements

I wish to thank Michael Cox, Electronics Technician, NWS New York NY for conducting the site visit very shortly after the event. Also, thanks to the entire Electronics Staff at NWS New York NY, for maintaining KISP at such a top notch level. I wish to thank our Met Intern/HMT Staff for their timely and accurate data collection effort for this historic event.

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Appendix A

Public Information Statement Showing Unofficial Observations taken during the 24 hour period for this storm

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NOUS41 KOKX 131729
PNSOKX
CTZ005>012-NJZ002-004-006-103>108-NYZ067>075-078>081-176>179-140529-

PUBLIC INFORMATION STATEMENT
SPOTTER REPORTS
NATIONAL WEATHER SERVICE NEW YORK NY
129 PM EDT WED AUG 13 2014

THE FOLLOWING ARE UNOFFICIAL OBSERVATIONS TAKEN DURING THE PAST 24
HOURS FOR THE STORM THAT HAS BEEN AFFECTING OUR REGION. APPRECIATION
IS EXTENDED TO HIGHWAY DEPARTMENTS...COOPERATIVE OBSERVERS...SKYWARN
SPOTTERS AND MEDIA FOR THESE REPORTS. THIS SUMMARY IS ALSO AVAILABLE
ON OUR HOME PAGE AT WEATHER.GOV/NYC

********************STORM TOTAL RAINFALL********************
```

LOCATION	STORM TOTAL RAINFALL /INCHES/	TIME/DATE OF MEASUREMENT			COMMENTS
CONNECTICUT					
...FAIRFIELD COUNTY...					
FAIRFIELD	1.63	1035	AM	8/13	TRAINED SPOTTER
BRIDGEPORT AIRPORT	1.59	1023	AM	8/13	ASOS
DANBURY	1.52	1200	PM	8/13	TRAINED SPOTTER
DANBURY AIRPORT	1.02	1024	AM	8/13	ASOS
BETHEL	0.70	1114	AM	8/13	TRAINED SPOTTER
...NEW HAVEN COUNTY...					
MADISON	4.50	909	AM	8/13	PUBLIC
NEW HAVEN	2.70	1025	AM	8/13	ASOS
HAMDEN	1.62	940	AM	8/13	TRAINED SPOTTER
MERIDEN	0.96	1029	AM	8/13	ASOS
...NEW LONDON COUNTY...					
MONTVILLE	4.45	903	AM	8/13	AMATEUR RADIO
LYME STATION	3.90	903	AM	8/13	EAST LYME
OLD LYME	3.62	1200	PM	8/13	PUBLIC
GROTON AIRPORT	2.40	1025	AM	8/13	ASOS
COLCHESTER	2.12	809	AM	8/13	AMATEUR RADIO
NEW JERSEY					
...BERGEN COUNTY...					
RIDGEWOOD	0.98	930	AM	8/13	TRAINED SPOTTER
TETERBORO	0.56	706	AM	8/13	ASOS
WESTWOOD	0.54	645	AM	8/13	TRAINED SPOTTER
OAKLAND	0.20	914	AM	8/13	TRAINED SPOTTER
...ESSEX COUNTY...					
MAPLEWOOD	0.74	1000	AM	8/13	PUBLIC
NEWARK AIRPORT	0.58	800	AM	8/13	ASOS
CALDWELL AIRPORT	0.41	800	AM	8/13	ASOS
...HUDSON COUNTY...					

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NOUS41 KOKX 131729
PNSOKX
CTZ005>012-NJZ002-004-006-103>108-NYZ067>075-078>081-176>179-140529-

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********************STORM TOTAL RAINFALL********************
```

LOCATION	STORM TOTAL RAINFALL /INCHES/	TIME/DATE OF MEASUREMENT			COMMENTS
CONNECTICUT					
...FAIRFIELD COUNTY...					
FAIRFIELD	1.63	1035	AM	8/13	TRAINED SPOTTER
BRIDGEPORT AIRPORT	1.59	1023	AM	8/13	ASOS
DANBURY	1.52	1200	PM	8/13	TRAINED SPOTTER
DANBURY AIRPORT	1.02	1024	AM	8/13	ASOS
BETHEL	0.70	1114	AM	8/13	TRAINED SPOTTER
...NEW HAVEN COUNTY...					
MADISON	4.50	909	AM	8/13	PUBLIC
NEW HAVEN	2.70	1025	AM	8/13	ASOS
HAMDEN	1.62	940	AM	8/13	TRAINED SPOTTER
MERIDEN	0.96	1029	AM	8/13	ASOS
...NEW LONDON COUNTY...					
MONTVILLE	4.45	903	AM	8/13	AMATEUR RADIO
LYME STATION	3.90	903	AM	8/13	EAST LYME
OLD LYME	3.62	1200	PM	8/13	PUBLIC
GROTON AIRPORT	2.40	1025	AM	8/13	ASOS
COLCHESTER	2.12	809	AM	8/13	AMATEUR RADIO
NEW JERSEY					
...BERGEN COUNTY...					
RIDGEWOOD	0.98	930	AM	8/13	TRAINED SPOTTER
TETERBORO	0.56	706	AM	8/13	ASOS
WESTWOOD	0.54	645	AM	8/13	TRAINED SPOTTER
OAKLAND	0.20	914	AM	8/13	TRAINED SPOTTER
...ESSEX COUNTY...					
MAPLEWOOD	0.74	1000	AM	8/13	PUBLIC
NEWARK AIRPORT	0.58	800	AM	8/13	ASOS
CALDWELL AIRPORT	0.41	800	AM	8/13	ASOS
...HUDSON COUNTY...					

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LOCATION	24 HOUR RAINFALL /INCHES/	TIME/DATE OF MEASUREMENT		COMMENTS
...WESTCHESTER COUNTY...				
SCARSDALE	1.40	1115 AM	8/13	TRAINED SPOTTER
WHITE PLAINS AIRPORT	0.85	800 AM	8/13	ASOS
**********24 HOUR RAINFALL**********				
CONNECTICUT				
...FAIRFIELD COUNTY...				
3 ENE WESTPORT	1.50	800 AM	8/13	COCORAHS
3 SSE BROOKFIELD	0.67	700 AM	8/13	COCORAHS
...MIDDLESEX COUNTY...				
1 N WESTBROOK CENTER	2.31	725 AM	8/13	COCORAHS
3 WSW EAST HAMPTON	0.93	700 AM	8/13	COCORAHS
1 S PORTLAND	0.87	800 AM	8/13	COCORAHS
...NEW HAVEN COUNTY...				
2 E MILFORD	1.51	900 AM	8/13	COCORAHS
2 NW NEW HAVEN	1.21	800 AM	8/13	COCORAHS
NEW JERSEY				
...BERGEN COUNTY...				
2 S RIVER VALE TWP	0.99	1044 AM	8/13	COCORAHS
WNW GLEN ROCK	0.81	800 AM	8/13	COCORAHS
1 E SADDLE BROOK TWP	0.75	730 AM	8/13	COCORAHS
1 W TENAFLY	0.71	700 AM	8/13	COCORAHS
1 SSE OAKLAND	0.22	725 AM	8/13	COCORAHS
WNW OAKLAND	0.16	720 AM	8/13	COCORAHS
1 ESE OAKLAND	0.08	700 AM	8/13	COCORAHS
...ESSEX COUNTY...				
1 WSW VERONA TWP	0.82	900 AM	8/13	COCORAHS
1 SE MAPLEWOOD TWP	0.72	700 AM	8/13	COCORAHS
1 NE CEDAR GROVE TWP	0.62	600 AM	8/13	COCORAHS
1 NE WEST CALDWELL T	0.58	900 AM	8/13	COCORAHS
...HUDSON COUNTY...				
N HARRISON	0.58	700 AM	8/13	COCORAHS
...PASSAIC COUNTY...				
1 WNW LITTLE FALLS T	0.79	800 AM	8/13	COCORAHS
S HAWTHORNE	0.66	530 AM	8/13	COCORAHS
3 SSE RINGWOOD	0.24	820 AM	8/13	COCORAHS
...UNION COUNTY...				
1 ESE NEW PROVIDENCE	0.78	800 AM	8/13	COCORAHS
1 NNW SUMMIT	0.75	700 AM	8/13	COCORAHS
1 NW UNION TWP	0.73	800 AM	8/13	COCORAHS
1 NE WESTFIELD	0.73	645 AM	8/13	COCORAHS
1 SSE KENILWORTH	0.71	1000 AM	8/13	COCORAHS
NEW YORK				
...KINGS COUNTY...				
3 NW BROOKLYN	0.95	700 AM	8/13	COCORAHS

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...NASSAU COUNTY...
   E LEVITTOWN           5.66   800 AM  8/13  COCORAHS
   W FLORAL PARK         2.53   700 AM  8/13  COCORAHS

...PUTNAM COUNTY...
   8 NE COLD SPRINGS     0.14   700 AM  8/13  COCORAHS
   4 ESE BEACON          0.08   620 AM  8/13  COCORAHS

...QUEENS COUNTY...
   1 SW MIDDLE VILLAGE   1.43   700 AM  8/13  COCORAHS

...RICHMOND COUNTY...
   1 SE STATEN ISLAND    0.73   730 AM  8/13  COCORAHS

...ROCKLAND COUNTY...
   1 WSW WEST NYACK      0.88   730 AM  8/13  COCORAHS

...SUFFOLK COUNTY...
   1 SSW JAMESPORT       0.73   900 AM  8/13  COCORAHS
   1 S SOUTHOLD          0.69   832 AM  8/13  COCORAHS
   1 WNW EAST MORICHES   0.15   800 AM  8/13  COCORAHS

...WESTCHESTER COUNTY...
   N PEEKSKILL           0.85   830 AM  8/13  COCORAHS
   1 SW YORKTOWN HEIGHT  0.73   800 AM  8/13  COCORAHS
   2 NW SOUTH SALEM      0.72   700 AM  8/13  COCORAHS

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JP
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Appendix B

The KISP ASOS gauge records precipitation to the nearest one hundredth of an inch every 5 minutes and transmits the data each hour.

METAR KISP 130156Z 12009KT 10SM FEW015 SCT035 OVC075 23/20 A2995 RMK AO2 RAB10E51 SLP139 P0000 T02280200
METAR KISP 130256Z 14012G19KT 10SM -DZ BKN070 OVC140 23/19 A2993 RMK AO2 DZB51 SLP133 P0000 60000 T02330189 58003
METAR KISP 130356Z 13009KT 10SM -RA FEW034 SCT050 BKN110 OVC140 21/17 A2992 RMK AO2 PK WND 14026/0306 DZE00RAB00 SLP131 LAST AUGMENTED OBSERVATION UNTIL 1000Z P0002 T02110172
METAR KISP 130456Z AUTO 14018G27KT 7SM -RA FEW095 BKN110 22/18 A2990 RMK AO2 PK WND 15027/0447 SLP122 P0003 T02170178 402670194
METAR KISP 130556Z AUTO 14011KT 5SM RA FEW029 BKN100 OVC120 20/17 A2988 RMK AO2 PK WND 13026/0534 SLP116 P0013 60018 T02000167 10239 20200 58018
METAR KISP 130656Z AUTO 08008KT 2SM R06/6000VP6000FT VCTS +RA BR BKN034 BKN055 OVC090 19/17 A2984 RMK AO2 TSB50 SLP103 P0035 T01890172
METAR KISP 130756Z AUTO 05017G22KT 3SM +RA BR SCT008 BKN014 OVC031 21/19 A2974 RMK AO2 TSE05 PRESFR SLP069 P0054 T02060194
METAR KISP 130856Z AUTO 01013G22KT 1 1/4SM R06/4000V6000FT +RA BR OVC010 20/19 A2973 RMK AO2 SLP065 P0084 60173 T02000189 56037
METAR KISP 130956Z AUTO 02015KT 1/2SM R06/2200V3000FT +RA FG VV006 20/19 A2973 RMK AO2 PK WND 02038/0933 SLP065 P0534 T02000194

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METAR KISP 131056Z AUTO 09005KT 1/2SM R06/2800V3500FT +RA FG VV012 21/20 A2972 RMK AO2 WSHFT 1015 SLP062 P0437 T02060200
METAR KISP 131156Z AUTO 12014G26KT 9SM OVC007 22/21 A2969 RMK AO2 PK WND 14026/1154 RAE55 SLP053 P0148 61292 71310 T02170206 10217 20189 58013
METAR KISP 131256Z 16020G30KT 4SM -RA BR BKN010 OVC023 22/21 A2968 RMK AO2 PK WND 14037/1226 WSHFT 1148 RAB41 SLP051 FIRST AUGMENTED OBSERVATION P0001 T02220206
METAR KISP 131356Z 15024G31KT 5SM -RA BR BKN008 BKN012 OVC023 23/21 A2968 RMK AO2 PK WND 14037/1305 RAE29B53 SLP049 P0015 T02280211
METAR KISP 131556Z 15016KT 6SM BR BKN009 BKN017 BKN028TCU 24/22 A2966 RMK AO2 RAE05B27E37 SLP042 TCU NE-SE P0000 T02390217
METAR KISP 131656Z 21011KT 10SM SCT011 BKN016 25/21 A2965 RMK AO2 RAB1558E04 SLP039 P0000 T02500211
METAR KISP 131756Z 29014G18KT 10SM FEW012 OVC016 25/21 A2964 RMK AO2 SLP036 60017 T02500206 10261 20217 58008
METAR KISP 131856Z 28011KT 10SM BKN022 BKN029 25/19 A2964 RMK AO2 SLP036 T02500194
METAR KISP 131956Z 30012G19KT 10SM SCT024 BKN031 27/19 A2964 RMK AO2 SLP034 T02670194
METAR KISP 132056Z 31011KT 10SM BKN030 BKN080 BKN210 27/18 A2964 RMK AO2 SLP036 CB DSNT NE T02670183 55000
METAR KISP 132156Z 28010KT 10SM FEW020 SCT030 SCT080 BKN150 26/18 A2964 RMK AO2 SLP036 T02610183
METAR KISP 132256Z 30004KT 10SM FEW025 SCT045CB BKN095 BKN130 BKN250 26/19 A2965 RMK AO2 SLP038 CB NW MOV E T02560189
KISP 132356Z 00000KT 7SM FEW025 SCT043CB BKN075 BKN140 21/19 A2967 RMK AO2 PK WND 28029/2330 TSB24E55RAB26E54 SLP046 CB NE-SE MOV E P0030 60030 T02110189 10272 20211 53011